UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/505,898	02/17/2000	Kirti Dave	065733/2262	7146

7590 12/10/2004

James Kamp, Esq
Rader, Fishman & Grauer, PLLC
39533 Woodward, Suite 140
Bloomfield Hills, MI 48304

EXAMINER	
WINKLER, ULRIKE	
ART UNIT	**PAPER NUMBER**
1648	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/505,898	DAVE ET AL.	
	Examiner	Art Unit	
	Ulrike Winkler	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *44-105* is/are pending in the application.

4a) Of the above claim(s) *48-53,57-59,66-71,82-87 and 93-105* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *44-47,54-56,60-65,72-81 and 88-92* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/6/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed August 13, 2004 in response to the Office action of February 13, 2004 is acknowledged and has been entered. Claims 44-47, 54-56, 60-65, 72-81, 88-92 are pending and are currently being examined.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Claim Rejections - 35 USC § 103

The rejection of claims 44-46, 54-56, 60-65,72-81 and 88-92 under 35 U.S.C. 103(a) over Oprandy et al. (Journal of Clinical Microbiology, 1990, see IDS #5), Huang et al. (U.S.Pat. No. 5,712,172), WHO Bulletin (Bulletin of the World Health Organization, 1996, see IDS #5) and Snowden et al. (Journal of Immunological Methods, 1991, see IDS #5) **is maintained** for reasons of record.

The instant invention is drawn to a method of analyzing an arthropod sample for an agent that may cause disease in humans. The method (claim 44) contains the following steps: (a) obtaining the arthropod sample, (b) treating the sample to expose the analyte from the arthropod, (c) contacting the liquid permeable support which contains a capture reagent with the sample from the previous step (d) allowing liquid to flow through the support by capillary action, (e) detecting the presence of the analyte and (f) using a plurality of detectable analyte specific reagents for detecting arthropod carried agents. The claims contain the following additional limitations: the detection moiety, the placement of the analyte specific reagent, the arthropod is a

mosquito, the liquid permeable support contains a control area, the analyte specific reagents are monoclonal antibodies, or gold and latex labeled antibodies.

Applicant's arguments and the Office's response are essentially the same as those of record. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's arguments regarding the Snowden et al. reference have been fully considered but fail to persuade. Applicants' arguments are drawn to the point that the reference does not use antibodies directed to an arthropod sample but instead uses an antibody directed to an antigen found in the blood stage of the malarial parasite. Applicants' argument fails to appreciate the general teaching of the Snowden et al. reference that changing the assay format from an ELISA based system to a dipstick is based on the interaction between the antibody and the antigen and the change in format does not produce an unexpected result. The reference clearly teaches that there is no difference in using the same antibody antigen combination in a dipstick assay versus an ELISA assay. The ordinary artisan upon reading the Snowden et al. reference would know that any antibody that works in an ELISA assay would predictably work in a dip stick assay.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge

generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Applicant's arguments are that Oprandy et al. teaches away from nitrocellulose-based membrane tests. In reviewing the Oprandy et al. reference, both PVDF membrane as well as a nylon membrane (see Oprandy et al., page 1701, materials and methods) were used. The Oprandy et al. reference does not indicate that nitrocellulose as the porous material does not function. Additionally, Applicant's indicate "Huang et al. teaches the use of nitrocellulose for the porous material to achieve adequate mechanical strength critical for providing favorable test results." Applicants are suggesting that the only porous material taught by Huang et al. is nitrocellulose, this is not the case. Although the reference exemplifies the use nitrocellulose membrane, the reference indicates that many materials such cellulose, glass fiber and nylon are contemplated as the proper membrane (see Huang et al., U.S. Pat. No. 5,712,172, column 5, lines 11-24). Applicant's arguments are that non-preferred embodiments cannot be used to make a 35 U.S.C. 103 obvious type rejection. The court has not found this to be the case, see *In re Lamerti and Konort* 192 USPQ 278, 280 (CCPA 1976), "....is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments must be considered." *In re Lamerti and Konort* and *In re Gurley* both indicate that the use of a non-preferred embodiment in the prior art does not render the product unobvious. Applicant's invention is claiming the use of antibodies to detect disease agents in an arthropod sample using a device, such as a dipstick, which can be made up of nitrocellulose or any other porous material.

Oprandy et al. indicates that nitrocellulose is a functional substance in a membrane-based test, the reference does not indicate that the nitrocellulose membrane cannot be used. Oprandy et

al. teach a dot-blot immunobinding assay to detect arthropod-borne agents. The method includes isolating the sporozoite from the mosquito, treating the sporozoite with a detergent to expose the analyte (see materials and methods). Alternately, sporozoite containing mosquitoes were homogenized together in the presence of detergent before spotting onto the filter. An antibody to detect the circumsporozoite protein was used to assay for the presence of the etiologic agent (see figure 2). The titration of the arthropod vector with SDS liberates the antigen. The reference also teaches that this same technique can be used for other arthropod –vectored etiologic agents (see page 1703, column 2, last paragraph). The reference does not apply the sample to a dipstick device for the detection of the analyte.

Huang et al. teach the use of a lateral flow device for the detection of an analyte in a single step. The reference does not limit the material to nitrocellulose and can be any material that allows lateral flow (see column 5, lines 12-23). Capillary flow is the result of surface tension. It is the surface tension that moves water through the material; this is regardless of the positioning of the device vertical/horizontal as the water will move from the wetted area to the dry area by way of wicking action. The Huang et al. device contains a sample receiving region which is in direct contact with the liquid sample that contains the analyte, a separate analyte detection region and an end flow region all made of porous material which wicks the liquid through the analyte detection region (see Huang et al. claim 1). The analyte detection region includes labeling reagents, a capture reagent and a control reagent also an antibody. Therefore the reference teaches using more than one analyte specific reagent (meeting the plurality limitation of the instant claims). The device can be used for the detection of analytes directly from a biological sample. The reference teaches a method of setting up the test strip, using the

appropriate controls and utilizing colored detection agent. The physical construction of the device is the same as the instantly claimed dipstick. The reference also teaches the various detection moieties that can be used with the analyte detection reagent. The reference does not teach detecting an etiologic agent from a mosquito sample.

WHO Bulletin teaches a dipstick assay for the detection of a malarial antigen found in the blood of an infected patient. Here the following steps are used: a blood sample is collected, then the blood is mixed with a lysing agent, the dipstick is placed vertically in the sample and the sample is rapidly taken up by capillary action, a detection agent is then added to sample well, the dipstick is washed and the dipstick is analyzed for the presence of a positive reaction (see figure 1 and page 48 column 2, last paragraph). The dipstick construction contains a reagent control as well. The method steps do not require a prefiltration step of the sample to remove cell debris from the whole blood lysates. The reference teaches the detection of a blood stage malarial antigen, the reference does not teach the detection of a mosquito stage antigen from a mosquito sample.

Snowden et al. teaches that antibodies used in an ELISA setting can be readily adapted to a dipstick assay, to produce a dipstick test that can detect multiple antigens (see abstract and page 64, column 2). The dipstick assay has the advantage that two or more antigens may be tested at the same time. In this case the assay tested for human or chicken blood from a mosquito that has had a recent blood meal. The dipstick can be made from a variety of materials including nitrocellulose, nylon or PVFD (see page 59, column2). The reference does not teach specific arthropod carried agents.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the analyte detection reagents as taught by Oprandy et al. and apply them to the device taught by Huang et al., the WHO bulletin and Snowden et al. One having ordinary skill in the art would have been motivated to do this because in order to determine the risk of arthropod-vector disease spread it is necessary to survey the insect population for these etiologic agent. This information is important to assess the efficacy of insect control and abatement programs. One having ordinary skill in the art would have a high expectation of success in applying the antibodies and the methods of exposing the analyte using detergents as taught by Oprandy et al. and formulate them into the device as taught by Huang et al., the WHO Bulletin and Snowden et al. Snowden et al. clearly teaches that reagents used for an ELISA based test are predictably adaptable to the dipstick protocol. In the experiments comparing blood meal analysis of mosquito using the dipstick assay and ELISA showed 100% agreement and 100% accuracy (see Snowden et al., page 58, last paragraph). Therefore, the instant invention is obvious over Oprandy et al., Huang et al., the WHO Bulletin and Snowden et al.

The rejection of claims 44-47, 54-56, 60-65, 72-81 and 88-92 under 35 U.S.C. 103(a) as being unpatentable over Oprandy et al. (Journal of Clinical Microbiology, 1990, from applicant's IDS), Huang et al. (U.S.Pat. No. 5,712,172), WHO Bulletin (Bulletin of the World Health Organization, 1996, see IDS #5) and Snowden et al. (Journal of Immunological Methods, 1991, see IDS #5) in view of Rattanarithikuln et al. (American Journal of Tropical Medicine, 1996, from applicant's IDS) and Sithiprasasna et al. (Annals of Tropical Medicine and Parasitology, from applicant's IDS) **is maintained** for reason of record.

Applicant's arguments and the Office's response are essentially the same as those set out in the above rejection. Applicant further argues that neither Rattanarithikuln et al. or Sithiprasasna et al. teach or motivate the selection of monoclonal antibodies for the detection of arthropod-borne disease vectors. This is not found convincing because Rattanarithikuln et al. teach using monoclonal antibodies in ELISA detection assay (see page 116, 3rd paragraph). Sithiprasasna et al. teach using monoclonal antibodies for the detection of Dengue virus a flavivirus (see page 399, column 1). The addition of a panel assay in the newly added claims does not provide a contribution over the prior art. It is obvious from the prior art that Rattanarithikuln et al. disclosed that they used two different monoclonal antibodies in an ELISA assay to differentiate whether the misquotes carries *P. vivax* or *P. falciparum.* Merely changing the format of an assay (vertical v. horizontal or PVDF v nitrocellulose) that depends on the same unique interaction between an antibody and the antigen for its functions does not distinguish the instant invention over the prior art. Snowden et al. clearly teaches that reagents used for an ELISA based test are predictably adaptable to the dipstick protocol. In the experiments comparing blood meal analysis of mosquito using the dipstick assay and ELISA showed 100% agreement and 100% accuracy (see Snowden et al., page 58, last paragraph). Snowden et al. also teaches that the dipstick assay has the advantage that two or more antigens may be tested at the same time, indicating the efficiency of the assay method. Therefore, the instant invention is obvious over Oprandy et al., Huang et al., WHO Bulletin and Snowden et al. in view of Rattanarithikuln et al. and Sithiprasasna et al.

Conclusion

No claims allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ulrike Winkler, Ph.D. whose telephone number is 571-272-0912. The examiner can normally be reached M-F, 8:30 am - 5 pm. The examiner can also be reached via email [ulrike.winkler@uspto.gov].

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel, can be reached at 571-272-0902.

The official fax phone number for the organization where this application or proceeding is assigned is 703-872-9306; for informal communications please the fax phone number will change to 571-273-0912

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

ULRIKE WINKLER, PH.D.
PRIMARY EXAMINER 12/1/04